

REMARKS/ARGUMENTS

Applicant thanks the Examiner for the Official Action dated November 3, 2005. In response to the issues raised, we offer the following submissions.

Claim Informalities

Claims 10, 29 and 46 are objected to for the use of the term ‘areal’ instead of ‘area’. We submit that the term ‘areal’ is grammatically correct and properly describes the type of density of nozzles to which the claims are directed. The dictionary defines ‘areal’ to be an adjective meaning ‘of or relating to, or involving an area’. In the context of claims 10, 29 and 46, ‘areal’ is the appropriate adjective to use in relation to the noun ‘density’. The term ‘area’ is a noun and therefore, it would be incorrect to use it instead of ‘areal’.

Claims – 35USC§103

Claims 1-7, 9, 11-12, 18-26, 28, 30-31, 38-43, 45, 47-48 and 54 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara. Claims 8 and 27 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara in further view of US 5,841,452 to Silverbrook. Claims 13, 14, 32 and 33 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara in further view of US 6,019,457 to Silverbrook. Claims 15 and 34 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara in further view of US 4,965,594 to Komuro. Claims 16 and 35 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara in further view of The Fabrication and Reliability Testing of Ti/TiN Heaters by DeMoor. Claims 17 and 36 stand rejected as obvious in light of US 5,706,041 to Kubby, in view of US 4,707,705 to Hara in further view of US 5,969,005 to Yamashita.

The Applicant disagrees. Claim 1 is limited to printheads with each heater less than 50 microns from its corresponding ejection aperture. As described at page 20, lines 18-25, the Applicant’s work has shown that positioning the heater element close to the ejection aperture reduces the work that the bubble exerts on the ink in order to eject a droplet. Therefore, the heater can generate the necessary bubble using less input energy and so the overall printhead efficiency increases.

Hara fails to teach a printhead with the heater positioned less than 50 microns from the ejection aperture. At column 5, lines 55-61, Hara discusses influence that the separation between the ink and the heater element has on the efficiency of the printhead. This is describing the benefits of reducing any coatings or protective layers that act to thermally insulate the heater from the ink. By keeping the protective layer between the ink and heater as thin as possible, there is less heat lost by conduction to the underlying substrate. However, Hara does not mention the possibility of moving the heater closer to the ejection aperture in order to reduce the mass of ink that needs to be displaced in order to eject a droplet. Therefore, modifying the printhead of Kubby with the teaching of Hara does not yield the present invention.

According, claim 1 is not obvious in light of the cited references, and it follows that dependent claims 2-18 are also non-obvious. Likewise, independent claims 19 and 38 are similarly non-obvious in view of the prior art, as are their respective dependent claims 20-37 and 39-54.

Non-Statutory Double Patenting

Claims 1-54 stand rejected as unpatentable over claims 1, 5-54 of co-pending application number 10/728,884, under the doctrine of non-statutory double patenting.

The Applicant disagrees. Pursuant to the above, Hara fails to disclose at heater to nozzle opening separation of less than 50 microns, or suggest that the distance from the heater to the ejection aperture has any bearing on printhead efficiency. Accordingly, the ordinary worker would have no motivation to modify the '884 invention with Hara in order to yield the present invention.

In light of this, claims 1-54 of the present application are patentably distinct from the claims of '884.

We submit that all the above objection and rejections have been successfully traversed and the application is in order for allowance. Accordingly, favourable reconsideration is courteously solicited.

Very respectfully,

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